REMARKS

Initially, Applicant would like to express his appreciation to Examiner Lee for the courtesies extended to Applicant's attorney during a telephone interview on February 19, 2004. Although agreement was not reached on specific claim amendments, Applicant has endeavored to amend the claims consistent with the points discussed with the Examiner.

After the foregoing amendment, claims 28, 30-32, and 34-35 are pending in the application. Applicant respectfully requests additional consideration and review of the claims in view of the foregoing amendment and the following remarks.

Claim Rejections Under 35 U.S.C. §112

Claims 29 - 33 were rejected under 35 U.S.C. §112. Applicant has responded by amending claim 30 and canceling claims 29 and 33. The rejection of claims 31-32 under 35 U.S.C. 112 is believed to have been obviated by the amendment of claim 30.

Rejections Under 35 U.S.C. § 103(a)

The Examiner has rejected claims 9 and 28-33 under 35 U.S.C. § 103(a) as being unpatentable over Barenys et al. (U.S. 6,145,036 A) in view of various other references.

Applicant has canceled claims 9, 29 and 33. Applicant regards them as unnecessary in view of amendments made to other claims in the application.

As stated in the prior amendment, an important aspect of Applicant's invention is its unique means of insuring high reliability on a hierarchy of I^2C buses provided by the use of paired Layered I^2C Protocol (LIP) bridges. Partnering LIP bridges allows the host I^2C bus master to cross check data provided by the partner LIP bridge as a technique to virtually guarantee data integrity, as described on page 28, lines 5 -11 of Applicant's specification. Also, partnering allows a LIP bridge to use partnering signals to reset the other LIP bridge to isolate faults.

This aspect of the invention is pointed out, for example, in claim 28, lines 15-21 which indicate that the host I^2C bus master is operable to use the recited two LIP bridges "to determine if transactions through a particular LIP bridge are corrupted ... to cross check data provided by each of said at least two LIP bridge devices ... to use partnering signals to reset the other LIP bridge device to isolate faults."

Claims Rejected under Barenys and Khosrowpour

Claim 28 was rejected under 35 U.S.C. §103(a) as being unpatentable over Barenys (U.S. 6,145,036 A) in view of Khosrowpour (U.S. 6,202,115 B1).

Barenys provides an I^2C bus expansion processor. The bus expansion processor is used in Barenys to isolate various buses containing expansion devices in the system and contain a bus failure to one component in the system, as pointed out in Barenys in column 1, lines 62-65.

Khosrowpour provides two interconnected bridges that are coupled to a parent bus and to a child bus. In Khosrowpour, the first bridge performs transactions while the second bridge stores data in its cache while in a standby mode. The second bridge transmits data from its cache only when a failure occurs in the first bridge, as pointed out, for example, in column 2, lines 41 – 46 of the Khosrowpour patent.

In the Office Action, the Examiner contends that it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the fault tolerant redundant bus bridge system as disclosed by Khosrowpour in the system disclosed by Barenys for improved performance, reliability and data protection. Applicant asserts, however, that even if the cited references could be combined, the resulting combination would not embody Applicant's inventive teachings nor anticipate Applicant's claims.

First, as noted by the Examiner in the Office Action, Barenys does not specifically disclose two expansion processors interconnected on a parent bus. This distinction alone is sufficient to distinguish Applicant's invention from Barenys.

Second, although Khosrowpour provides two interconnected bridges that are coupled to a parent bus and to a child bus, Khosrowpour does not teach that the host master is operable to "<u>cross check data provided by each of said at least two LIP bridge devices to verify integrity of data received from said target devices</u>" as claimed by Applicant. Khosrowpour makes no mention of the two bridges cross checking data to verify integrity of data received from said target devices and it cannot be assumed to exist in the patent.

Third, Khosrowpour does not teach or suggest the limitation recited in Applicant's claim 28 calling for "<u>each of said at least two LIP bridge devices being adapted to use partnering signals to reset the other LIP bridge device to isolate faults</u>". These distinctions are sufficient to distinguish Applicant's invention from Khosrowpour.

Combining Barenys with Khosrowpour would not embody Applicant's claimed invention. As noted above, Applicant's claim 28 calls for the host master being operable to "cross check data provided by each of said at least two LIP bridge devices to verify integrity of data received from said target devices ... ". Neither Barenys nor Khosrowpour teach this limitation, either when taken individually or in combination. Nor does the cited combination teach "each of said at least two LIP bridge devices being adapted to use partnering signals to reset the other LIP bridge device to isolate faults", as claim 28 also requires. These distinctions are sufficient to distinguish Applicant's invention from the proposed combination of Barenys and Khosrowpour.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the § 103(a) rejection of claim 28.

Claims Rejected under Barenys, Khosrowpour, and Marshall

Claims 29-30 were rejected under 35 U.S.C. §103(a) as being unpatentable over Barenys in view of Khosrowpour and further in view of Marshall et al. (U.S. 5,915,082 A). Claim 29 has been canceled and claim 28 has been amended with the limitation from claim 29. As such, this rejection is

deemed to be moot with respect to claim 29, but will be addressed in the context of amended claim 28.

The Office Action states that Barenys and Khosrowpour do not teach the limitation, now recited in claim 28, calling for "each of said at least two LIP bridge devices being adapted to use partnering signals to reset the other LIP bridge device to isolate faults". The Examiner proposes to combine Marshall with Barenys and Khosrowpour as the basis for rejecting this claim limitation. Marshall teaches error detection, isolation, and recovery in lockstep processor systems. In Marshall, processors operate independently, but in lockstep, to process the same task with independently generated results compared in order to detect errors originating from one processor.

First, in Applicant's claimed invention, a LIP bridge operates as a slave to the host bus master on its parent bus, and a master to the target devices on its child bus. Also, the partnered LIP bridges in Applicant's claimed invention are "peer" devices to each other, meaning both LIP bridges are operable to perform the same operations in the same manner. This aspect is pointed out in Applicant's claim 28 limitations that call for "at least two LIP bridge devices being operable to transmit messages between said host bus master and said target devices" and "each of said at least two LIP bridge devices being adapted to use partnering signals to reset the other LIP bridge device to isolate faults". Contrary to Applicant's invention, the processors in Marshall are designated as either "master" processor or "slave" processor, with each "master" or "slave" having its own set of predefined operations. For example, only the master is allowed to physically send data to an I/O device, as pointed out in column 6, lines 51-55. As known by those skilled in the art, "master" devices are capable of initiating communications and exercising control functions with respect to its "slave" devices. However, Applicant believes that it is novel for a peer device to exercise such control functions over another peer device, which is not taught or suggested by Marshall.

Second, Marshall appears to show that the processors can <u>disable</u> each other as shown in Marshall's Fig. 9. However, contrary to Applicant's limitation

calling for "each of said at least two LIP bridge devices being adapted to use partnering signals to reset the other LIP bridge device to isolate faults", Marshall makes no mention of the two processors being adapted to use partnering signals to <u>reset</u> the other to isolate faults. As known by those skilled in the art, "reset" means to return a device to its standard or initial state, however, the device is still available for use. Disabling means that a device or features of the device are no longer available for use. Rather than resetting the processors, Marshall teaches error detection, isolation, and recovery in lockstep processor systems, wherein recovery refers to the actions that a master, slave, or the system takes to disable either processor or the lockstep feature on both processors. These distinctions are sufficient to distinguish Applicant's invention from Marshall.

The Barenys and Khosrowpour combination does not teach or suggest the limitation calling for "each of said at least two LIP bridge devices being adapted to use partnering signals to reset the other LIP bridge device to isolate faults" for the above-mentioned reasons. Marshall does not cure the deficiencies noted in the preceding rejection for Barenys and Khosrowpour, and indeed, Marshall has its own deficiencies as set forth above. Therefore, the combination of Barenys, Khosrowpour and Marshall does not embody Applicant's claim 29 limitation.

With respect to claim 30, the Barenys, Khosrowpour, and Marshall combination does not teach or suggest the limitations recited in Applicant's independent claim 28 for the above-mentioned reasons. Since claim 30 depends from and therefore includes all the limitations of independent claim 28, it is therefore also believed to be allowable for the same reasons set forth above for the respective independent claim 28, as well as for other novel features.

Applicant's claim 30 limitation calling for "said host bus master is operable to hold a failed interconnected LIP bridge device in a reset state in which said failed interconnected LIP bridge device is electrically removed from said child bus" is an additional novel feature, however, the Examiner asserts that this limitation reads on Khosrowpour's teaching. Even assuming that Hub 201 in Khosrowpour is a "host master" and PCI-PCI Bridge 214 is a "LIP bridge device", the fact remains that, contrary to Applicant's claim 30, Khosrowpour does not

teach holding a failed interconnected LIP bridge in a reset state in which said failed interconnected LIP bridge is electrically removed from said child bus. As known by those skilled in the art, reset means to return a device to its standard or initial state, however, the device is still available for use. Khosrowpour has no such teaching of holding a failed interconnected LIP bridge in a reset state. Also, although Khosrowpour states "even though the first bus bridge has failed or been removed", this teaching implies "physical" rather than "electrical" removal of the failed bridge. Therefore, the combination of Barenys, Khosrowpour and Marshall does not embody Applicant's claim 30 limitation.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the § 103(a) rejection of claims 29-30.

Claims Rejected under Barenys, Khosrowpour, Marshall and Staab

Claims 31-32 were rejected under 35 U.S.C. §103(a) as being unpatentable over Barenys in view of Khosrowpour, and in view of Marshall et al., and further in view of Staab (U.S. 4,377,000). The Barenys, Khosrowpour, and Marshall combination does not teach or suggest the limitations recited in Applicant's independent claim 28 or intervening claim 30 for the above-mentioned reasons. Staab does not cure the deficiencies noted above for Barenys, Khosrowpour, and Marshall. Since claims 31-32 depend from claim 30, which depends from independent claim 28, these dependent claims are therefore also believed to be allowable for the same reasons set forth above for claims 28 and 30. Therefore, the combination of Barenys with Khosrowpour, Marshall, and Staab still does not embody Applicant's claims 31-32.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the § 103(a) rejection of claims 31-32.
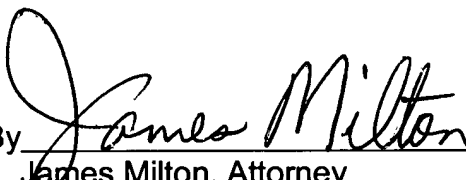
New Claims

New claims 34-35 have been added. These claims provide additional limitations directed to the partnered LIP bridge devices.

Conclusion

In view of the foregoing amendments and remarks, Applicant submits that claims 28, 30-32 and 34-35 are in condition for allowance, and reconsideration is therefore respectfully requested. If there are any outstanding issues that the Examiner feels may be resolved by way of a telephone conference, the Examiner is invited to contact the undersigned to resolve the issues.
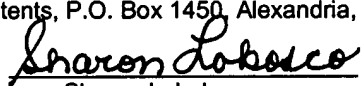
Respectfully submitted,

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Date: MARCH 8, 2004

Atts.

11